

The opinion in support of the decision being entered today was **not** written for publication and is **not** precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ISIK C. KIZILYALLI, YI MA,
and PRADIP KUMAR ROY

Appeal No. 2004-2049
Application No. 10/158,467

ON BRIEF

Before KIMLIN, PAK and PAWLIKOWSKI, **Administrative Patent Judges.**

PAWLIKOWSKI, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 3-7, and 9-19.

Claims 1, 4, and 9 are representative of the subject matter on appeal and are set forth below:

1. A method of making an integrated circuit having an oxidizable layer with a surface, comprising:
growing a strain reducing oxide layer on the oxidizable surface in a dry oxidizing atmosphere;
depositing a high-k dielectric layer on the grown oxide layer;

depositing an oxide layer on the high-k dielectric layer; and
densifying the deposited oxide layer and the grown oxide layer in an oxidizing atmosphere, thereby removing traps in the grown oxide layer and the deposited oxide layer.

4. The method as recited in claim 1, wherein the perovskite material is of the form $MTiO_3$, where M is selected from the group consisting of Sr, Ba, La, Ti, Pb, Ba_xSr_{1-x} , and Pb_xLa_{1-x} .

9. The method as recited in claim 5, wherein the deposited oxide layer is deposited in a LPCVD reactor.

On page 5 of the brief, appellants state that the claims stand or fall together. We select, therefore, claims 1, 4, and 9 (from each respective rejection), for our consideration in this appeal.

Claims 1, 3, 5-7 and 12-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Yoon.

Claims 4 and 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over Yoon in view of Shindo.

Claims 9, 10, 11, 17, 18, and 19 stand rejected under 35 U.S.C. § 103 as being unpatentable of Yoon in view of Yamazaki.

The examiner relies upon the following references as evidence of unpatentability:

Yoon et al (Yoon)	5,668,724	November 1997
Shindo et al (Shindo)	5,738,731	April 1998
Yamazaki et al. (Yamazaki)	6,168,980	January 2001

OPINION

I. The rejection of claims 1, 3, 5-7 and 12-14 under 35 U.S.C. § 102(b) as being anticipated by Yoon

We consider claim 1 in this rejection.

We refer to pages 3-4 of the answer regarding the examiner's position in this rejection. We refer to pages 7-8 of the brief regarding appellants' rebuttal in this rejection.

Appellants argue that Yoon does not teach any pressures under which the oxide layer is grown, and therefore one cannot conclude or infer that Yoon teaches a strain reducing oxide layer. Brief, page 7. Hence, the dispositive question is whether "a strain reducing" oxide layer is disclosed in Yoon. On this record, we answer this question in the affirmative.

As an initial matter, we note that it is well settled that "when the claimed and prior art products are identical or substantially identical or are produced by an identical or substantially identical process, the PTO can require an applicant to prove that the prior art does not necessarily or inherently possess the characteristics of his claimed product." In re Best, 652 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977).

In the instant case, we find that the specification, beginning at line 34, on page 34, through page 3, line 6, recites as follows (text in bold for emphasis only):

In more detail, the wafer 1 includes an exemplary silicon substrate 2 which has grown thereon an oxide layer 3, here a silicon dioxide layer with the silicon coming substantially [from] the substrate 2. The layer 3 is preferably grown **in a conventional dry oxidizing atmosphere at 0.25 to 10 torr and 650 to 900°C to form 1 to 2 nm thick oxide** [emphasis added], the thickness not being critical but of sufficient thickness to . . .

The layer 3 **is believed** to help reduce strain

between the later deposited high-k dielectric layer 4 and the underlying silicon substrate 2 and provides a good interface with the silicon to reduce undesired surface states in the silicon.

Yoon discloses what appears to be the same oxide layer as claimed by appellants, made by a process similar to the process disclosed in appellants' specification. See Figures 1-6 and columns 3-6 of Yoon. Because there is reasonable basis to "believe" that the oxide layer of Yoon is identical or substantially identical to appellants' claimed oxide layer, the burden shifts to appellants to show that in fact the oxide layer of Yoon cannot reduce strain. We reiterate that the Patent Office can require appellants to prove that a function or property relied upon for novelty is not possessed by the prior art otherwise meeting the limitations of the claims. In re Best, 652 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977). Absent such evidence, as in the present case, we affirm the anticipation rejection.

II. The 35 U.S.C. § 103 rejection of claims 4 and 15 as being obvious over Yoon in view of Shindo

We consider claim 4¹ in this rejection.

We refer to pages 4-5 of the answer. We refer to pages 8-9 of the brief regarding appellants' response to the examiner's rejection.

Appellants argue that the combination of Yoon and Shindo is improper because there is no teaching in either Yoon or Shindo

¹ Although the copy of claim 4 as set forth in appellants' appendix indicates that claim 4 depends upon claim 1, because there is no antecedent basis for "the perovskite material" recited in claim 4, we treat claim 4 in this appeal as being dependent upon claim 3.

that would have motivated one skilled in the art to substitute the Ta₂O₅ of Yoon with the perovskite taught in Shindo. Brief, page 8. We disagree for the following reasons.

As pointed out on page 8 of the answer by the examiner, Yoon teaches that the high-K dielectric can be Ta₂O₅ or other high-K dielectric material. The examiner states that Yoon is silent as to the high-K dielectric material being a perovskite type dielectric material. The examiner relies upon Shindo for teaching that it is known in the art that the type of perovskite material as claimed in claim 4 is a known alternative to Ta₂O₅. Shindo does indicate that these materials have each been used in this art as a dielectric material. See column 17, lines 3-23, column 134, lines 46-59, and column 124 of Shindo, lines 16-23.

Appellants argue that the perovskites in Shindo have particular characteristics that would discourage one skilled in the art from substituting Ta₂O₅ for the perovskites (appellants refer to column 124 of Shindo, lines 16-23). However, as held in the case of In re Gurley, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1132 (Fed. Cir. 1994), a known or obvious material does not become patentable simply because the art described it as somewhat inferior. In the instant case, we determine that the skilled artisan would not have been dissuaded from using perovskites as the dielectric material in the device of Yoon. Shindo discusses using films having a high dielectric constant. See column 17, lines 3-23. Shindo uses perovskites in making DRAM devices, which are the same devices made in Yoon.

In view of the above, we affirm the 35 U.S.C. § 103 rejection of claims 4 and 15.

III. The rejection of claims 9, 10, 11, and 17-19 under 35 U.S.C. § 103 as being obvious over Yoon in view Yamazaki

We consider claim 9 in this rejection.

We refer to page 5 of the answer regarding the examiner's position in this rejection. On pages 9-10 of the brief, appellants present the arguments regarding this rejection.

On page 10 of the brief, appellants argue that Yamazaki's teaching of depositing a silicon dioxide layer in a LPCVD reactor is different from a teaching regarding a strain reducing oxide layer on an oxidizable surface in a dry oxidizing atmosphere.

It appears appellants are arguing a limitation that is not set forth in claim 9, as pointed out by the examiner on page 9 of the answer. That is, claim 9 requires the method as recited in claim 5 (which depends upon claim 1) wherein the deposited oxide layer is deposited in a LPCVD reactor, not the strain reducing oxide layer. Hence, it is the deposited oxide layer at issue. That is, claim 1 recites growing a strain reducing oxide layer, and then depositing a high-K dielectric layer on the grown layer, and then depositing an oxide layer on the high-K dielectric layer, and then densifying that deposited oxide layer. Hence, it appears that appellants' arguments are not directed to the claimed invention. We therefore are not persuaded by such arguments.

In view of the above, we therefore affirm the 35 U.S.C. § 103 rejection of claims 9-11 and 17-19.

IV. Conclusion

Each of the rejections is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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CHUNG K. PAK)	INTERFERENCES
Administrative Patent Judge)	
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BEVERLY A. PAWLIKOWSKI)	
Administrative Patent Judge)	

BAP/sld

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HITT GAINES, P.C.
P.O. BOX 832570
RICHARDSON, TX 75083